

Ninth International Conference on Sustainability in Energy and Buildings (SEB17)

Energy Procedia Volume 134

Chania, Greece
5 – 7 July 2017

Editors:

**J. Littlewood
R.J. Howlett**

ISBN: 978-1-5108-5008-8

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© by Elsevier B.V.
All rights reserved.

Printed by Curran Associates, Inc. (2017)

For permission requests, please contact Elsevier B.V.
at the address below.

Elsevier B.V.
Radarweg 29
Amsterdam 1043 NX
The Netherlands

Phone: +31 20 485 3911
Fax: +31 20 485 2457

<http://www.elsevierpublishingsolutions.com/contact.asp>

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

PREFACE	1
<i>John Littlewood, Robert J. Howlett</i>	
SMOOTH MODE TRANSFER IN AC MICROGRIDS DURING UNINTENTIONAL ISLANDING	12
<i>Walid Issa, Ahmad El Khateb, Nader Anani, Mohammad Abusara</i>	
MANAGING SMART GRIDS USING PRICE RESPONSIVE SMART BUILDINGS	21
<i>Joseph Carr, Alexander Brissette, Enrico Ragaini, Luca Omati</i>	
PRELIMINARY STUDY OF THE CONDITION OF SOCIAL HOUSING IN THE CITY OF DURANGO, MÉXICO	29
<i>Claudia Karelly Romero-Pérez, Norma Alejandra Rodríguez-Muñoz, María Guadalupe Alpuche-Cruz, Ignacio Ramiro Martín-Domínguez</i>	
FAULT IDENTIFICATION-BASED VOLTAGE SAG STATE ESTIMATION USING ARTIFICIAL NEURAL NETWORK	40
<i>Huilian Liao, Nader Anani</i>	
DESIGN AND DEVELOPMENT OF A WEB BASED GIS PLATFORM FOR ZERO ENERGY SETTLEMENTS MONITORING	48
<i>Kostas Gobakis, Aggeliki Mavriannaki, Kostas Kalaitzakis, Dionysia-Denia Kolokotsa</i>	
DATA ANALYSIS OF THE ENERGY PERFORMANCE OF LARGE SCALE SOLAR COLLECTORS FOR DISTRICT HEATING	61
<i>Michel Noussan, Matteo Jarre, Luca Degiorgis, Alberto Poggio</i>	
EVALUATION OF ANALYTICAL METHODS FOR PARAMETER EXTRACTION OF PV MODULES	69
<i>Haider Ibrahim, Nader Anani</i>	
IDENTIFICATION OF THE EFFICIENT MANUFACTURING CHARACTERISTICS	79
<i>Kolesnikova Olga Valerevna, Kazarinov Lev Sergeevich, Nelubina Anastasia Dmitrievna</i>	
THE IMPLICATIONS OF DEMAND RESPONSE MEASURES AND ELECTRIFICATION OF TRANSPORT ON UK HOUSEHOLD ENERGY DEMAND AND CONSUMPTION	89
<i>Aikaterini Chatzivasileiadi, Eleni Ampatzi, Ian P. Knight</i>	
THE IMPACT OF COURTYARD PARAMETERS ON ITS SHADING LEVEL AN EXPERIMENTAL STUDY IN BAGHDAD, IRAQ	99
<i>Omar Al-Hafith, Satish B K, Simon Bradbury, Pieter de Wilde</i>	
ASSESSMENT OF POLICY BASED RESIDENTIAL SOLAR PV POTENTIAL USING GIS-BASED MULTICRITERIA DECISION ANALYSIS: A CASE STUDY OF APELDOORN, THE NETHERLANDS	110
<i>B.B. Kausika, O. Dolla, W.G.J.H.M. van Sark</i>	
ENERGY EFFICIENCY MEASURES FOR BUILDINGS IN HEBRON CITY AND THEIR EXPECTED IMPACTS IN THE DISTRIBUTION GRID	121
<i>P. Lazzeroni, S. Olivero, F. Stirano, C. Micono, P. Montaldo, G. Zanzottera, F.U. Calí, M. Repetto</i>	
FLOODING RISK IN EXISTING URBAN ENVIRONMENT: FROM HUMAN BEHAVIORAL PATTERNS TO A MICROSCOPIC SIMULATION MODEL	131
<i>Gabriele Bernardini, Selene Camilli, Enrico Quagliarini, Marco D’Orazio</i>	
COMPARING REAL AND PREDICTED WINDOW USE IN OFFICES. A POE-BASED ASSESSMENT	141
<i>Francesca Stazi, Federica Naspi, Gabriele Bernardini, Marco D’Orazio</i>	
THERMAL COMFORT IN THE HISTORICAL URBAN CANYON: THE EFFECT OF INNOVATIVE MATERIALS	151
<i>Veronica Lucia Castaldo, Federica Rosso, Iacopo Golasi, Cristina Piselli, Ferdinando Salata, Anna Laura Pisello, Marco Ferrero, Franco Cotana, Andrea de Lieto Vollaro</i>	
IDENTIFYING AND WEIGHTING INDICATORS OF BUILDING ENERGY EFFICIENCY ASSESSMENT IN GHANA	161
<i>M.N. Addy, E. Adinyira, J. Ayarkwa</i>	
SMOOTHING OF RENEWABLE ENERGY GENERATION USING GAUSSIAN-BASED METHOD WITH POWER CONSTRAINTS	171
<i>Alemayehu Addisu, Laurent George, Pierre Courbin, Vincent Sciandra</i>	
GEOHERMAL CONTRIBUTION ON SOUTHERN EUROPE CLIMATE FOR ENERGY EFFICIENCY OF UNIVERSITY BUILDINGS. WINTER SEASON	181
<i>Armando Pinto, Fernanda Rodrigues, André Mota</i>	

MULTI-STEP AHEAD WIND FORECASTING USING NONLINEAR AUTOREGRESSIVE NEURAL NETWORKS	192
<i>Adil Ahmed, Muhammad Khalid</i>	
EFFECT OF OPERATION PARAMETERS ON EFFICIENCY OF PHOTOVOLTAIC THERMAL SENSOR USING WATER.....	205
<i>Maifi Lyes, Kerbache Tahar, Hioual Ouided, Chari Abdelhamid</i>	
NEW HOMEBUYERS AND THE CHALLENGES OF NAVIGATING SUSTAINABILITY AND ENERGY EFFICIENCY WITH AUSTRALIAN VOLUME BUILDERS	214
<i>Georgia Warren-Myers</i>	
EMBODIED ENERGY AND OPERATIONAL ENERGY EVALUATION IN TALL BUILDINGS ACCORDING TO DIFFERENT TYPOLOGIES OF FAÇADE.....	224
<i>Roberto Giordano, Matteo Giovanardi, Giulia Guglielmo, Carlo Micono</i>	
CAE METHODS FOR PLATE HEAT EXCHANGER DESIGN	234
<i>Václav Dvorský, Tomáš Vít</i>	
SUPPLYING HISTORIC BUILDINGS WITH ENERGY, WITHOUT IMPINGING ON THEIR HISTORIC AND CULTURAL VALUES	244
<i>Giorgio Garau, Marco Rosa-Clot</i>	
EFFECT OF WATER BODY FORMS ON MICROCLIMATE OF RESIDENTIAL DISTRICT.....	256
<i>Hong Jin, Teng Shao, Renlong Zhang</i>	
THE MICROCLIMATE EFFECT OF URBAN PARK FITNESS TRAIL IN SPRING ---- A CASE STUDY OF HARBIN ZHAO LIN PARK	266
<i>Xiao-long Zhao, Dong-qi Zhao, Ye Zhou, Jia-jun Lv</i>	
VARIATIONS OF PV MODULE PARAMETERS WITH IRRADIANCE AND TEMPERATURE	276
<i>Haider Ibrahim, Nader Anani</i>	
MUNICIPAL SOLID WASTE AS A VALUABLE RENEWABLE ENERGY RESOURCE: A WORLDWIDE OPPORTUNITY OF ENERGY RECOVERY BY USING WASTE-TO-ENERGY TECHNOLOGIES.....	286
<i>Diego Moya, Clay Aldás, Germánico López, Prasad Kaparaju</i>	
PROPOSED INTEGRATION OF A PHOTOVOLTAIC SOLAR ENERGY SYSTEM AND ENERGY EFFICIENT TECHNOLOGIES IN THE LIGHTING SYSTEM OF THE UTA-ECUADOR.....	296
<i>Andrés Hidalgo, Lizbeth Villacrés, Rodney Hechavarría, Diego Moya</i>	
QUANTIFYING THE EFFECTS OF INTERIOR SURFACE REFLECTANCE ON INDOOR LIGHTING	306
<i>Nastaran Makaremi, Samuele Schiavoni, Anna Laura Pisello, Francesco Asdrubali, Franco Cotana</i>	
A STATE-OF-ART REVIEW OF RETROFIT INTERVENTIONS IN BUILDINGS TOWARDS NEARLY ZERO ENERGY LEVEL.....	317
<i>Mehrdad Rabani, Habtamu B. Madessa, Natasa Nord</i>	
WASTE-TO-ENERGY TECHNOLOGIES: AN OPPORTUNITY OF ENERGY RECOVERY FROM MUNICIPAL SOLID WASTE, USING QUITO - ECUADOR AS CASE STUDY	327
<i>Diego Moya, Clay Aldás, David Jaramillo, Esteban Játiva, Prasad Kaparaju</i>	
ETHICAL ISSUES OF MONITORING SENSOR NETWORKS FOR ENERGY EFFICIENCY IN SMART BUILDINGS: A CASE STUDY	337
<i>Ylenia Cascone, Maria Ferrara, Luigi Giovannini, Gianluca Serale</i>	
THE ROLE OF SHADING DEVICES TO IMPROVE THERMAL AND VISUAL COMFORT IN EXISTING GLAZED BUILDINGS.....	346
<i>Gianpiero Evola, Federica Gullo, Luigi Marletta</i>	
ENVIRONMENTAL PERFORMANCE AND SOCIAL INCLUSION: A PROJECT FOR THE ROCINHA FAVELA IN RIO DE JANEIRO.....	356
<i>Andrea Arcidiacono, Francesco Causone, Mario Grosso, Gabriele Maserà, Massimo Tadi, Hadi Mohammad Zadeh</i>	
PERFORMANCE OF DETACHED EDDY SIMULATION APPLIED TO ANALYSIS OF A UNIVERSITY CAMPUS WIND ENVIRONMENT.....	366
<i>Rallou Dadioti, Simon Rees</i>	
TOWARDS HIGH ENERGY PERFORMING HISTORICAL BUILDINGS. A METHODOLOGY FOCUSED ON OPERATION AND USERS' ENGAGEMENT STRATEGIES	376
<i>Giorgia Spigliantini, Valentina Fabi, Stefano Paolo Corgnati</i>	
OPERATIONAL PERFORMANCE OF AN AIR HANDLING UNIT: INSIGHTS FROM A DATA ANALYSIS.....	386
<i>Michel Noussan, Giovanni Carioni, Luca Degiorgis, Matteo Jarre, Paolo Tronville</i>	
TOWARDS A PROBABILISTIC APPROACH IN LCA OF BUILDING RETROFIT MEASURES	394
<i>Claudio Favi, Ivan Meo, Elisa Di Giuseppe, Monica Iannaccone, Marco D'Orazio, Michele Germani</i>	

NUMERICAL ASSESSMENT OF THE IMPACT OF ROOF REFLECTIVITY AND BUILDING ENVELOPE THERMAL TRANSMITTANCE ON THE UHI EFFECT	404
<i>Elisa Di Giuseppe, Marianna Pergolini, Francesca Stazi</i>	
INSULATING COAT TO PREVENT MOLD GROWTH IN THERMAL BRIDGES	414
<i>Stefano Fantucci, Francesco Isaia, Valentina Serra, Marco Dutto</i>	
ANALYSIS OF THERMAL ENVIRONMENT OF OPEN COMMUNITY STREETS IN WINTER IN NORTHERN CHINA.....	423
<i>Yumeng Jin, Jian Kang, Hong Jin, Jing Zhao</i>	
A STUDY ON MITIGATION POTENTIAL IN SERVICE BUILDING SECTOR: EFFICIENT TECHNOLOGY IMPLICATIONS OF CHINA’S INTENDED NATIONALLY DETERMINED CONTRIBUTION	432
<i>Rui Xing, Tatsuya Hanaoka, Yuko Kanamori, Toshihiko Masui</i>	
ADDRESSING THE CHALLENGES OF PUBLIC HOUSING RETROFITS	442
<i>Cláudia Sousa Monteiro, Francesco Causone, Sónia Cunha, André Pina, Silvia Erba</i>	
INCLUSION OF ON-SITE RENEWABLES IN DESIGN-STAGE BUILDING LIFE CYCLE ASSESSMENTS.....	452
<i>C. Galpin, A. Moncaster</i>	
INSIGHTS ON PRO-ENVIRONMENTAL BEHAVIOR TOWARDS POST-CARBON SOCIETY	462
<i>Valentina Fabi, Maria Valentina Di Nicoli, Giorgia Spigiantini, Stefano Paolo Corgnati</i>	
ON SPATIAL DISTRIBUTION AND DETERMINANTS OF URBAN PHOTOVOLTAIC UTILIZATION IN CHINA.....	470
<i>Alin Lin, Ming Lu, Can Li</i>	
REDUCTION OF SOLAR PV PAYBACK PERIOD USING OPTIMALLY PLACED REFLECTORS	480
<i>D.T.P. Wijesuriya, K.D.S.H. Wickramathilaka, L.S. Wijesinghe, D.M. Vithana, H.Y. Ranjit Perera</i>	
AEROBRICK — AN AEROGEL-FILLED INSULATING BRICK	490
<i>Jamnis Wernery, Avner Ben-Ishai, Bruno Binder, Samuel Brunner</i>	
OPPORTUNITIES FOR HEAT PUMPS ADOPTION IN EXISTING BUILDINGS: REAL-DATA ANALYSIS AND NUMERICAL SIMULATION.....	499
<i>M. Jarre, M. Noussan, A. Poggio, M. Simonetti</i>	
COMPUTATIONAL FLUID DYNAMICS ANALYSIS FOR EVALUATING THE URBAN HEAT ISLAND EFFECTS	508
<i>Antonio Gagliano, Francesco Nocera, Stefano Aneli</i>	
DESIGN OF A SMART SYSTEM FOR INDOOR CLIMATE CONTROL IN HISTORIC UNDERGROUND BUILT ENVIRONMENT.....	518
<i>Francesca Stazi, Benedetta Gregorini, Andrea Gianangeli, Gabriele Bernardini, Enrico Quagliarini</i>	
MICROCLIMATE PERCEPTION FEATURES OF COMMERCIAL STREET IN SEVERE COLD CITIES	528
<i>Tuoyu Hou, Ming Lu, Jingwan Fu</i>	
SMART COOL MORTAR FOR PASSIVE COOLING OF HISTORICAL AND EXISTING BUILDINGS: EXPERIMENTAL ANALYSIS AND DYNAMIC SIMULATION	536
<i>Federica Rosso, Anna Laura Pisello, Veronica Lucia Castaldo, Franco Cotana, Marco Ferrero</i>	
THE EFFECT OF WEATHER DATASETS ON BUILDING ENERGY SIMULATION OUTPUTS.....	545
<i>Silvia Erba, Francesco Causone, Roberto Armani</i>	
A STRATEGY TO REDUCE GRID STRESS THROUGH PRIORITY-BASED INVERTER CHARGING.....	555
<i>Ali Ahmad, Muhammad Junaid Subhani, Naveed Arshad</i>	
SUBMERGED PV SOLAR PANEL FOR SWIMMING POOLS: SP3	567
<i>Marco Rosa Clot, Paolo Rosa-Clot, Giuseppe Marco Tina</i>	
SHAPE OPTIMIZATION OF LOW SPEED WIND TURBINE BLADES USING FLEXIBLE MULTIBODY APPROACH.....	577
<i>Ayman A. Nada, Ali S. Al-Shahrani</i>	
PRELIMINARY STUDY OF THE HYBRID SOLAR DEC “NAC WALL” SYSTEM INTEGRATION IN BUILDING FAÇADES IN URBAN CONTEXT	588
<i>Marco Simonetti, Vincenzo Gentile, Giacomo Chiesa, Marianna Nigra</i>	
RAST: ROUNDABOUT SOLAR TRACKING	598
<i>Marco Rosa-Clot, Paolo Rosa-Clot, Giuseppe Marco Tina, Cristina Ventura</i>	
FIELD RESEARCH AND STUDY OF CAMPUS THERMAL ENVIRONMENT IN WINTER IN SEVERE COLD AREAS	607
<i>Hong Jin, Liang Qiao, Bo Wang</i>	

DESIGN AND MODELLING TECHNIQUES OF PERMANENT MAGNET FAULT CURRENT LIMITER	616
<i>Asmaiel Ramadan, Faris Alnaemi</i>	
THE BENEFITS OF USING AEROGEL-ENHANCED SYSTEMS IN BUILDING RETROFITS	626
<i>Umberto Berardi</i>	
ACHIEVING NEARLY ZERO ENERGY BUILDINGS IN CYPRUS, THROUGH BUILDING PERFORMANCE SIMULATIONS, BASED ON THE USE OF INNOVATIVE ENERGY TECHNOLOGIES	636
<i>Marina Kyprianou Dracou, Mat Santamouris, Costas N. Papanicolas</i>	
OBJECTIVE AND SUBJECTIVE EVALUATION OF THERMAL COMFORT IN THE LOCCIONI LEAF LAB	645
<i>Marina Laskari, Francesco Carducci, Daniela Isidori, Martina Senzacqua, Laura Standardi, Cristina Cristalli</i>	
DEVELOPMENT AND TESTING OF A MICRO-GRID EXCESS POWER PRODUCTION FORECASTING ALGORITHMS	654
<i>Angeliki Mavrigiannaki, Nikos Kampelis, Denia Kolokotsa, Daniele Marchegiani, Laura Standardi, Daniela Isidori, Cristina Christalli</i>	
FLOATING PHOTOVOLTAIC PLANTS AND WASTEWATER BASINS: AN AUSTRALIAN PROJECT	664
<i>Marco Rosa-Clot, Giuseppe Marco Tina, Sandro Nizetic</i>	
THERMAL COMFORT EVALUATION IN HVAC DEMAND RESPONSE CONTROL	675
<i>N. Kampelis, A. Ferrante, D. Kolokotsa, K. Gobakis, L. Standardi, C. Cristalli</i>	
THE ADAPTIVE COMFORT FACTOR IN EVALUATING THE ENERGY PERFORMANCE OF OFFICE BUILDINGS IN THE MEDITERRANEAN COASTAL CITIES	683
<i>Despina Serghides, Stella Dimitriou, Ioanna Kyprianou, Costas Papanicolas</i>	
UHI EFFECTS AND STRATEGIES TO IMPROVE OUTDOOR THERMAL COMFORT IN DENSE AND OLD NEIGHBOURHOODS	692
<i>G. Evola, A. Gagliano, A. Fichera, L. Marletta, F. Martinico, F. Nocera, A. Pagano</i>	
3D PRINTING OF BUILDINGS: CONSTRUCTION OF THE SUSTAINABLE HOUSES OF THE FUTURE BY BIM	702
<i>Mehmet Sakin, Yusuf Caner Kiroglu</i>	
STUDY ON THE INFLUENCE OF PILOTI RATIO ON THERMAL COMFORT OF RESIDENTIAL BLOCKS BY LOCAL THERMAL COMFORT ADAPTATION SURVEY AND CFD SIMULATIONS	712
<i>Tianyu Xi, Jianhua Ding, Hong Jin, Akashi Mochida</i>	
FUZZY LOGIC ENERGY MANAGEMENT FOR A PHOTOVOLTAIC SOLAR HOME	723
<i>Fathia Chekired, Achour Mahrane, Zoubeyr Samara, Madjid Chikh, Abderrazak Guenounou, Aissa Meflah</i>	
URBAN SUSTAINABILITY MOBILITY ASSESSMENT: INDICATORS PROPOSAL	731
<i>Joaquim Macedo, Fernanda Rodrigues, Fernando Tavares</i>	
THE THERMAL COMFORT OF URBAN PEDESTRIAN STREET IN THE SEVERE COLD AREA OF NORTHEAST CHINA	741
<i>Hong Jin, Siqi Liu, Jian Kang</i>	
THERMAL COMFORT OF RAILWAY STATION'S WAITING ROOM IN SEVERE COLD REGIONS OF CHINA	749
<i>Meng Huang, Yujie Lin</i>	
AN OPTIMIZATION DESIGN APPROACH OF FOOTBALL STADIUM CANOPY FORMS BASED ON FIELD WIND ENVIRONMENT SIMULATION	757
<i>Ligang Shi, Rongrong An</i>	
PERMANENT MAGNET FAULT CURRENT LIMITER FOR THE POWER GRID	768
<i>Asmaiel Ramadan</i>	
A NOVEL MODULAR DESIGN APPROACH TO “THERMAL CAPACITY ON DEMAND” IN A RAPID DEPLOYMENT BUILDING SOLUTIONS: CASE STUDY OF SMART-POD	776
<i>Boris Ceranic, John Beardmore, Adrian Cox</i>	
THE ‘SAFETY GAP’ IN BUILDINGS: PERCEPTIONS OF WELSH FIRE SAFETY PROFESSIONALS	787
<i>J.R. Littlewood, M. Alam, S. Goodhew, G. Davies</i>	
A STUDY TO ASSESS ALTERNATIVE WATER SOURCES FOR REDUCING ENERGY CONSUMPTION IN A MEDICAL FACILITY CASE STUDY, ABU DHABI	797
<i>G. Seguela, J.R. Littlewood, G. Karani</i>	
URBAN MORPHOLOGY INDICATORS FOR SOLAR ENERGY ANALYSIS	807
<i>Michele Morganti, Agnese Salvati, Helena Coch, Carlo Cecere</i>	

EFFECTS OF THERMAL INSULATION ON THERMAL COMFORT IN LOW-INCOME TROPICAL HOUSING	815
<i>Arman Hashemi</i>	
THERMAL COMFORT IN ZERO ENERGY BUILDINGS	825
<i>Laura Pomfret, Arman Hashemi</i>	
INTRODUCTION TO A WALES PROJECT FOR EVALUATING RESIDENTIAL RETROFIT MEASURES AND IMPACTS ON ENERGY PERFORMANCE, OCCUPANT FUEL POVERTY, HEALTH AND THERMAL COMFORT	835
<i>J.R. Littlewood, G. Karani, J. Atkinson, D. Bolton, A.J. Geens, D. Jahic</i>	
EXPERIMENTAL VALIDATION OF GRAVITY ENERGY STORAGE HYDRAULIC MODELING	845
<i>Khalid Loudiyi, Asmae Berrada</i>	
TOWARD AN IMPROVEMENT OF GRAVITY ENERGY STORAGE USING COMPRESSED AIR	855
<i>Asmae Berrada, Khalid Loudiyi, Izeddine Zorkani</i>	
MINING TYPICAL LOAD PROFILES IN BUILDINGS TO SUPPORT ENERGY MANAGEMENT IN THE SMART CITY CONTEXT	865
<i>Alfonso Capozzoli, Marco Savino Piscitelli, Silvio Brandi</i>	
ON THE COMPARISON OF OCCUPANCY IN RELATION TO ENERGY CONSUMPTION AND INDOOR ENVIRONMENTAL QUALITY: A CASE STUDY	875
<i>M.N. Assimakopoulos, N. Bamparesos, A. Pantazaras, T. Karlessi, S.E. Lee</i>	
AN ENERGY EFFICIENCY ASSESSMENT OF THE THERMAL COMFORT IN AN OFFICE BUILDING	885
<i>Zhidan Zhao, Mahdi Houchati, AbdlMonem Beitelmal</i>	
Author Index	